has not been entered. Thus, the instant amendment is based upon the claims in the Amendment dated Feb. 5, 2002. Attached hereto is a marked-up version of the changes made to the claim(s) by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

The disclosure stands objected to under 35 U.S.C. Section 132, and claims 1, 10 and 23 stand rejected under 35 U.S.C. Section 112, first paragraph. In this regard, the Office Action contends that the subject matter added to claim 1 in the Amendment of July 24, 2001 (i.e., "***only*** a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on the metal-wiring-pattern side . . . ***no*** insulating protective film other than said first insulating protective film covers the metal wiring pattern and the through hole on the metal wiring pattern side") represents "new matter" and is not supported by the application as originally filed. This objection/rejection is respectfully traversed for at least the following reasons.

Fig. 1b, for example and without limitation, of the instant application as originally filed shows ***only*** protective film 30 covering lead 28 and through-hole 25 on the metal wiring pattern side. No other protective film is located on the metal-wiring-pattern side of the tape 22 proximate the through-hole 25. This is what applicant is claiming, and it cannot possibly represent "new matter" because it was in the application as originally filed. It is clearly shown in Fig. 1(b) (see also Fig. 1(a)). In addition, the instant specification explains at page 41, lines 19+, that "since the formation of the solder resist is made ***only once***, the number of days in manufacturing the tape carrier 23 can be shortened by one day, as compared with the case in which the formation of solder resist is

carried out twice. . . " (emphasis added). Thus, in addition to the drawings as filed, the text of the application as filed also emphasizes the advantage of providing only one protective resist film over lead 28 on the metal wiring pattern side. The application as filed clearly supports this aspect of the instant claimed invention.

Claim 5 stands rejected under 35 U.S.C. Section 112, second paragraph, as allegedly being indefinite. This Section 112, rejection is respectfully traversed. The Office Action contends that in claim 5 "the semiconductor elements" lack antecedent basis. However, proper antecedent basis appears to be present in claim 1, line 2.

Claims 1, 2, 4, 6-11, 13, 15, 16-19, and 23-27 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over admitted prior art (APA) and Miyamura. This §103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires "only a first insulating protective film for insulating and covering the metal wiring pattern and the through hole at locations over and proximate the through hole, so that no other insulating film is located on the metal-wiring-pattern side of the insulating tape proximate the through hole, ... on the metal-wiring-pattern side of the insulating tape no insulating protective film other than said first insulating protective film covers the metal wiring pattern proximate the through hole." For example and without limitation, see Fig. 1(b) of the instant application, where **only** solder resist film 30 covers the wiring pattern 28 on the metal-wiring-pattern side of the tape proximate or near through-hole 105. No other protective film is provided over wiring pattern 28 near through hole 25. The cited art fails to disclose or suggest this aspect of claim 1.

In direct contrast to the inventions of claim 1, APA Figure 7 utilizes two solder resist films 110 and 111 to cover the wiring pattern proximate through hole 105. Thus, claim 1 cannot possibly be met by Figure 7. APA Figure 7 teaches directly away from the invention of claim 1 by requiring two separate solder resist films. Moreover, the structure of Figure 7 is problematic because epoxy solder resist 110 is very hard (young's modulus of 380 kgf/mm^2); thus rendering APA Fig. 7 inferior to the invention of claim 1 (i.e., resist 110 has a young's modulus much higher than the range required by claim 1). The problems with this are discussed at length in the instant specification. Citation to additional art cannot overcome the fundamental flaws associated with prior art Figure 7.

Miyamura also fails to disclose or suggest the aforesaid aspect of claim 1. Thus, even if these two references were combined, the invention of claim 1 still would not be met. The rejection should be withdrawn.

Independent claim 10 requires "the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and wherein on the metal-wiring-pattern side of the insulating tape only the first insulating protective film insulates and covers the metal wiring pattern proximate the through hole, and the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof." As explained above, neither the APA nor Miyamura disclose or suggest this aspect of claim 10. Claim 23 also requires that on the metal-wiring-pattern side of the insulating tape no insulating solder resist other than said first insulating solder resist protective film covers the metal wiring

pattern near the through hole – thereby defining over the cited art whether taken alone or in combination.

Claim 24 requires a "tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises: an insulating tape, a metal wiring pattern installed on one surface of the insulating tape, a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend, a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape, a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side, wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%." The cited art fails to disclose or suggest the subject matter of claim 24.

The arrangement of APA Fig. 7(b) uses solder resist 111 having a Young's modulus of 50 +/- 20 kgf/mm^2, and another type of solder resist 110 having a Young's modulus of 380 +/- 80 kgf/mm^2 on the metal wiring pattern side of substrate 102. Using only a resist 111 having a Young's modulus of 50 +/- 20 kgf/mm^2 would result in undesirable bleeding of the solder resist, and the addition solder resist 110 having a

Young's modulus of 380 +/- 80 kgf/mm^2 is used for preventing bleeding (e.g., see pg. 3 of the instant application). Omitting the solder resist 110 having a Young's modulus of 380 +/- 80 kgf/mm^2 from the arrangement of Fig. 7(b) would thus lead to undesirable bleeding. Therefore, one of ordinary skill in the art would not have omitted resist 110 from the APA Fig. 7(b), because one of ordinary skill in the art would not have wanted bleeding to occur.

In contrast with APA Fig. 7(b), the invention of claim 24 requires both: (a) the solder resist on the metal wiring pattern side of the substrate to have a Young's modulus in the range of 5 kgf/mm^2 to 70 kgf/mm^2; and (b) the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%. APA Fig. 7(b) does not disclose either (a) or (b). *Surprisingly*, the claimed combination of (a) and (b) enables the instant invention to prevent or reduce bleeding *without* having to provide a harder solder resist with a 380 +/- 80 kgf/mm^2 Young's modulus. See for example the instant specification at pages 28-29. Thus, because of the claimed combination of (a) and (b), the metal wiring side resist(s) can achieve practical resistance to wire breaks and can avoid/reduce bleeding without the need for a harder solder resist with a 380 +/- 80 kgf/mm^2 Young's modulus.

Miyamura merely discloses improving general characteristics of solder resist, and fails to disclose or suggest suitable amounts of filler for bleeding prevention. In contrast, the invention of claim 24 is based on the finding that when applied to a curved part of a wiring board having a slit, the solder resist under the foregoing conditions achieves good

results in wire break testing and reduces development of bleeding (e.g., see page 35, line 18, through page 36, line 10, of the instant specification).

Accordingly, it would not have been obvious to have combined Miyamura and the APA as alleged in the Office Action. Claims 25-27 define over the cited art in a similar manner as that discussed above with respect to claim 24.

Finally, claims 1, 2, 4, 6-11, 13, 15, 16-19, and 23 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over the APA and Miyamura, and further in view of Tajima. See pages 16-19 of the Office Action. This Section 103(a) rejection is respectfully traversed for at least the following reasons.

APA Fig. 7 utilizes two different resist films 110 and 111 proximate through hole 105. The Figure 7 structure is problematic because film 110 is very hard and has a Young's modulus of 380 kgf/mm^2. In other words, film 110 has a Young's modulus much higher than that required by claim 1. The APA teaches, on page 3 of the instant application, that this high modulus enables film 110 to play "two roles for preventing the occurrence of bleed." Thus, APA Figure 7 desires and requires a film 110 with such a high Young's modulus; thereby teaching away from the instant claimed invention. In contrast, the instant specification explains in detail why the Young's modulus range required by claim 1 is advantageous over the prior art. *Unexpected results* are associated with the claimed Young's modulus.

Tajima illustrates a single "flexible" dry film resist 6 or 7 provided over conductive pattern 4 proximate a slit 2 in underlying film 1. However, Tajima fails to

disclose any particular Young's modulus for the resist film. Even if the resist 6 or 7 of Tajima were to be used in APA Fig. 7 (which applicant believes would be incorrect in any event), the claimed Young's modulus in claim 1 would still not be met, nor would the advantageous results associated therewith. Thus, even citing Tajima, the prior art still fails to disclose or suggest the inventions of claim 1, wherein only a single solder resist protective film covers the metal wiring pattern on the metal wiring pattern side of the tape proximate the through hole, where that solder resist protective film has a Young's modulus from 5-70 kgf/mm^2. Furthermore, the claimed filler range is also not disclosed or suggested.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Joseph A. Rhoa
Reg. No. 37,515

JAR:caj
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please cancel claims 8 and 17.

1. (*Amended*) A tape carrier package semiconductor device, which [has]includes a tape carrier and semiconductor elements that have been packaged on the tape carrier, said tape carrier package semiconductor device comprising:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating protective film for insulating and covering the metal wiring pattern and the through hole at locations over and proximate the through hole, so that no other insulating film is located on the metal-wiring-pattern side of the insulating tape proximate the through hole,

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating protective film for insulating and covering the through hole, and

resin sealing peripheral portions where the metal wiring pattern and a semiconductor element are connected;

wherein the first and second insulating protective films [are made of] comprise solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and wherein on the metal-wiring-pattern side of the insulating tape no insulating protective film other than said first insulating protective film covers the metal wiring pattern proximate the through hole, and wherein the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

5. (*Unamended*) The tape carrier package semiconductor device as defined in claim 1, wherein the periphery of portions at which the tape carrier and the semiconductor elements have been electrically connected is covered with liquid resin having an insulating property in a manner so as to allow the edge of the liquid resin to make an angle of not more than 70° with the upper surface of the first insulating protective film.

10. (*Unamended*) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, wherein said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating protective film for insulating and covering the metal wiring pattern and the through hole at locations over and proximate the through hole,

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating protective film for insulating and covering the through hole, and

resin for sealing periphery portions at which the semiconductor device and the metal wiring pattern are connected,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and wherein on the metal-wiring-pattern side of the insulating tape only the first insulating protective film insulates and covers the metal wiring pattern proximate the through hole, and the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

23. (*Unamended*) A tape carrier package semiconductor device comprising:

an insulating tape,

a metal wiring pattern on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape

a through hole provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating solder resist protective film for insulating and covering the metal wiring pattern and the through hole, and

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating solder resist protective film for insulating and covering the through hole,

wherein the first and second insulating solder resist protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and on the metal-wiring-pattern side of the insulating tape no insulating solder resist other than said first insulating solder resist protective film covers the metal wiring pattern near the through hole, and

wherein the solder resist of the first protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

24. (*Unamended*) A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and

wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

25. (*Unamended*) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and

wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

26. (*Unamended*) A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and

wherein the first insulating protective film is made of solder resist of one kind, and the solder resist contains a filler which determines viscosity thereof in a range of 10 wt% to 40 wt%.

27. (*Unamended*) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm^2 to 70 kgf/mm^2, and

wherein the first insulating protective film is made of only one kind of solder resist and contains a filler that determines viscosity thereof in the range of 10 wt% to 40 wt%.